AMENDMENDMENTS TO CLAIMS

claims 1-38 (canceled)

claim 39 (currently amended) A method for the production of a multiphase composite material, wherein the composite material comprises a major phase component and at least one minor phase component arranged in a desired predefined morphological structure in which said major phase component and said at least one minor phase component have predefined size and shape characteristics, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially continuous manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially continuous manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer according to controlled mixing parameters such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of predetermined and controllable morphology within said chaotic mixer and wherein at least one of the group consisting of said major phase component and said at least one minor phase component is in a substantially liquid state during mixing, and further, wherein the chaotically mixing step comprises a plurality of substantially discrete, controllable mixing stages of differing functionality to produce predetermined staged morphological changes with in the group consisting of said major phase component and said at least one minor phase component, and still further, ~~The~~

~~method of claim 38~~ wherein the controlling step includes selectively varying the shear rate in the chaotic mixer during the chaotically mixing step;

continuously discharging said in-situ structured arrangement from the chaotic mixer in the form of a structured extrudate of controllable morphological character;

controlling the chaotic mixing step to controllably and progressively develop the morphologies of said major phase component and said at least one minor phase component within said structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having said predefined morphological structure.

claim 40 (canceled)

claim 41 (currently amended) A method for the production of a multiphase composite material, wherein the composite material comprises a major phase component and at least one minor phase component arranged in a desired predefined morphological structure in which said major phase component and said at least one minor phase component have predefined size and shape characteristics, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially continuous manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially continuous manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer according to controlled mixing parameters such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of predetermined and controllable morphology within said chaotic mixer and wherein at least one of the group consisting of said major phase component and said at least one minor phase component is in a substantially liquid state during mixing, and further, wherein the chaotically mixing step comprises a plurality of substantially discrete, controllable mixing stages of differing functionality to produce predetermined staged morphological changes with in the group consisting of said major phase component and said at least one minor phase component, and still further, ~~The method as recited in claim 41~~wherein the controlling step includes reversing the direction of mixing during the chaotically mixing step;

continuously discharging said in-situ structured arrangement from the chaotic mixer in the form of a structured extrudate of controllable morphological character;

controlling the chaotic mixing step to controllably and progressively develop the morphologies of said major phase component and said at least one minor phase component within said structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having said predefined morphological structure.

claims 42-44 (canceled)

claim 45 (currently amended) A method for the production of a multiphase composite material, wherein the composite material comprises a major phase component and at least one minor phase component arranged in a desired predefined morphological structure in which said major phase component and said at least one minor phase component have predefined size and shape characteristics, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially continuous manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially continuous manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer according to controlled mixing parameters such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of predetermined and controllable morphology within said chaotic mixer and wherein at least one of the group consisting of said major phase component and said at least one minor phase component is in a substantially liquid state during mixing, and further, ~~The method recited in claim 29~~ wherein said at least one minor phase component comprises a substantially solid phase material which remains in a substantially unmelted state within said chaotic mixer and said major phase component comprises a polymeric material which is in a substantially liquid state within said chaotic mixer;

continuously discharging said in-situ structured arrangement from the chaotic mixer in the form of a structured extrudate of controllable morphological character;

controlling the chaotic mixing step to controllably and progressively develop the morphologies of said major phase component and said at least one minor phase component within said structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having said predefined morphological structure.

claim 46 (currently amended). A method for the production of a multiphase composite material, wherein the composite material comprises a major phase component and at least one minor phase component arranged in a desired predefined morphological structure in which said major phase component and said at least one minor phase component have predefined size and shape characteristics, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially continuous manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially continuous manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer according to controlled mixing parameters such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of predetermined and controllable morphology within said chaotic mixer and wherein at least one of the group consisting of said major phase component and said at least one minor phase component is in a substantially liquid state during mixing, and further, ~~The method as recited in claim 29,~~ wherein said major phase

component comprises a substantially solid phase material which remains in a substantially unmelted state within said chaotic mixer and said at least one minor phase component comprises a polymeric material which is in a substantially liquid state within said chaotic mixer;

continuously discharging said in-situ structured arrangement from the chaotic mixer in the form of a structured extrudate of controllable morphological character;

controlling the chaotic mixing step to controllably and progressively develop the morphologies of said major phase component and said at least one minor phase component within said structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having said predefined morphological structure.

claims 47-120 (canceled)

claim 121 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete layers with holes of predetermined size extending through one or more of said substantially discrete layers, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of structured morphology developed progressively within said chaotic mixer according to a pre-established controllable evolutionary process such that at a preliminary stage of said chaotic mixing, said in-situ structured arrangement comprises a plurality of substantially continuous layers of said major phase component and said at least one minor phase component disposed in substantially layered relation to one another and wherein upon further chaotic mixing said substantially continuous layers undergo progressive thinning and subsequent morphological transition towards layers with holes of increasing dimension; and

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially continuous layers and during morphological transition away from said substantially continuous layers such that said major phase component and said at least one minor phase component comprise a plurality of substantially discrete extended layers of predetermined size and shape of said major phase component and said at least one minor phase component wherein at least a portion of said substantially discrete extended layers includes a plurality of holes of predetermined size, and further, ~~The method of claim 107,~~ wherein during the chaotically mixing steps the viscosity of said at least one minor phase component divided by the viscosity of said major phase component is in the range 0.5 to 15.

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having predefined morphological structure.

claims 122-130 (canceled)

131 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete layers with holes of predetermined size extending through one or more of said substantially discrete layers, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of structured morphology developed progressively within said chaotic mixer according to a pre-established controllable evolutionary process such that at a preliminary stage of said chaotic mixing, said in-situ structured arrangement comprises a plurality of substantially

continuous layers of said major phase component and said at least one minor phase component disposed in substantially layered relation to one another and wherein upon further chaotic mixing said substantially continuous layers undergo progressive thinning and subsequent morphological transition towards layers with holes of increasing dimension; and

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially continuous layers and during morphological transition away from said substantially continuous layers such that said major phase component and said at least one minor phase component comprise a plurality of substantially discrete extended layers of predetermined size and shape of said major phase component and said at least one minor phase component wherein at least a portion of said substantially discrete extended layers includes a plurality of holes of predetermined size, and further, ~~The method as recited in claim 107~~ wherein said at least one minor phase component comprises a substantially solid phase material which remains in a substantially unmelted state within said chaotic mixer and said major phase component comprises a polymeric material which is in a substantially liquid state within said chaotic mixer;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having predefined morphological structure.

claim 132 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete layers with holes of predetermined size extending through one or more of said substantially discrete layers, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of structured morphology developed progressively within said chaotic mixer according to a pre-established controllable evolutionary process such that at a preliminary stage of said chaotic mixing, said in-situ structured arrangement comprises a plurality of substantially continuous layers of said major phase component and said at least one minor phase component disposed in substantially layered relation to one another and wherein upon further chaotic mixing said substantially continuous layers undergo progressive thinning and subsequent morphological transition towards layers with holes of increasing dimension;

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially continuous layers and

during morphological transition away from said substantially continuous layers such that said major phase component and said at least one minor phase component comprise a plurality of substantially discrete extended layers of predetermined size and shape of said major phase component and said at least one minor phase component wherein at least a portion of said substantially discrete extended layers includes a plurality of holes of predetermined size and further ~~The method as recited in claim 107~~ wherein said major phase component comprises a substantially solid phase material which remains in a substantially unmelted state within said chaotic mixer and said at least one minor phase component comprises a polymeric material which is in a substantially liquid state within said chaotic mixer;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having predefined morphological structure.

claims133-134 (canceled)

claim 135 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete layers with holes of predetermined size extending through one or more of said substantially discrete layers, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of structured morphology developed progressively within said chaotic mixer according to a pre-established controllable evolutionary process such that at a preliminary stage of said chaotic mixing, said in-situ structured arrangement comprises a plurality of substantially continuous layers of said major phase component and said at least one minor phase component disposed in substantially layered relation to one another and wherein upon further chaotic mixing said substantially continuous layers undergo progressive thinning and subsequent morphological transition towards layers with holes of increasing dimension ~~The method as recited in claim 107~~ and further, wherein at least one of the group consisting of said major phase component and said at least one minor phase component includes an interfacial tension reducing additive; ~~and~~

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially continuous layers and during morphological transition away from said substantially continuous layers such that said major phase component and said at least one minor phase component comprise a plurality of substantially discrete extended layers of predetermined size and shape of said major phase component and said at least one minor phase component wherein at least a

portion of said substantially discrete extended layers includes a plurality of holes of predetermined size;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having predefined morphological structure.

claim136 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete layers with holes of predetermined size extending through one or more of said substantially discrete layers, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner; supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement of structured morphology developed progressively within said chaotic mixer according to a pre-established controllable evolutionary process such that at a preliminary stage of said chaotic mixing, said in-situ structured arrangement comprises a plurality of substantially continuous layers of said major phase component and said at least one minor phase

component disposed in substantially layered relation to one another and wherein upon further chaotic mixing said substantially continuous layers undergo progressive thinning and subsequent morphological transition towards layers with holes of increasing dimension and further ~~The method of claim 107~~ wherein said major phase component is electrically conductive and said at least one minor phase component is substantially electrically non-conductive; ~~and~~

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially continuous layers and during morphological transition away from said substantially continuous layers such that said major phase component and said at least one minor phase component comprise a plurality of substantially discrete extended layers of predetermined size and shape of said major phase component and said at least one minor phase component wherein at least a portion of said substantially discrete extended layers includes a plurality of holes of predetermined size;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid construction having predefined morphological structure.

claims 137-144 (canceled)

claim145 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor

phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component, ~~The method as recited in claim 140,~~ wherein at least one of the group consisting of said major phase component and said at least one minor phase component comprises a substantially solid phase material which remains substantially unmelted during said chaotically mixing step;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claim 146 currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component, and wherein at least one of the group consisting of said major phase component and said at least one minor phase component comprises a substantially solid phase material which remains substantially unmelted during said chaotically mixing step and further, ~~The method as recited in claim 145~~ wherein said substantially solid phase material is electrically conductive;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claims 147-151 (canceled)

claim152 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component and further, wherein the chaotically mixing step comprises a plurality of substantially discrete controllable mixing stages of differing functionality to produce predetermined staged morphology changes within the group consisting of said major phase component and said at least one minor phase component and still further, ~~The method as recited in claim 151~~ wherein the controlling steps include selectively varying the shear rate in the chaotic mixer at different stages during the chaotically mixing step

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claim153 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component and further, wherein the chaotically mixing step comprises a plurality of substantially discrete controllable mixing stages of differing functionality to produce predetermined staged morphology changes within the group consisting of said major phase component and said at least one minor phase component and still further, ~~The method as recited in claim 151~~ wherein the controlling steps include utilizing a selective combination of two dimensional chaotic mixing and three dimensional chaotic mixing during the chaotically mixing step;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claim 154 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component and further, wherein the chaotically mixing step comprises a plurality of substantially discrete controllable mixing stages of differing functionality to produce predetermined staged morphology changes within the group consisting of said major phase component and said at least one minor phase component and still further, ~~The method as recited in claim 151~~ wherein the controlling steps include reversing the direction of mixing during the chaotically mixing step whereby structural development is

at least partially reversed such that the interpenetration between said major phase component and said at least one minor phase component is reduced;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claims 155-156 (canceled)

claim157 (currently Amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase

component and further, ~~The method as recited in claim 140~~ wherein said major phase component is substantially electrically conductive and said at least one minor phase component is electrically nonconductive;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claims 158-159 (cancelled)

claim160 (currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at

least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component and further, wherein said major phase component is substantially electrically nonconductive and said at least one minor phase component is electrically conductive, and in addition wherein said major phase component is a plastic and said at least one minor phase component is electrically conductive and finally, ~~The method as recited in claim 159~~ electrical conductivity of said multiphase construction initially decreases to a predefined limit during the chaotic mixing step as said major phase component and said at least one minor phase component undergo interpenetration, and wherein electrical resistivity thereafter undergoes a subsequent rapid increase so as to approach a substantially insulating character upon further chaotic mixing and wherein during the controlling step the chaotic mixing step is terminated at a stage resulting in a desired level of electrical resistivity.

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claim 161(currently amended). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component wherein said major phase component and said at least one minor phase component are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supply said at least one minor phase component to said chaotic mixed in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement comprising an interpenetrating blend of said major phase component and said at least one minor phase component and further, wherein said major phase component is substantially electrically nonconductive and said at least one minor phase component is electrically conductive, and in addition wherein said major phase component is a plastic and said at least one minor phase component is an electrically conductive additive, and finally wherein electrical resistivity of said multiple phase construction initially decreases to a predefined limit during the chaotically mixing step as said major phase component and said at least one minor phase component undergo interpenetration, and wherein electrical resistivity thereafter undergoes a subsequent rapid increase so as to approach a substantially insulating character upon further chaotic mixing and wherein during the controlling step

the chaotically mixing step is terminated at a stage resulting in a desired level of electrical resistivity;

controlling the chaotic mixing steps such that the chaotic mixing is terminated at a controlled stage of interpenetration of said major phase component and said at least one minor phase component and further, ~~The method as recited in claim 160~~ wherein the chaotic mixer is reversed in response to a measured increase in resistivity of the interpenetrating blend at an advanced stage of chaotic mixing whereby a controlled decrease in electrical resistivity is realized within said interpenetrating blend;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controlling forming said in-situ extrudate into a suitably solid multiple phase construction wherein said major phase component and said at least one minor phase component are arranged in interpenetrating blended relation.

claim162 (original) A method for the manufacture of a multiple phase composite construction having a first phase polymeric component and a second phase polymeric component wherein said first and second phase polymeric components are in interpenetrating blended relation with one another, the method comprising the steps of:

supplying said first phase polymeric component to a chaotic mixer in a substantially controlled manner;

supplying said second phase polymeric component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said first phase polymeric component with said second phase polymeric component within said chaotic mixer to yield an in-situ structured arrangement

comprising an interpenetrating blend of said major phase component and said minor phase component;

controlling the chaotic mixing step such that the chaotic mixing is terminated at a controlled stage of interpenetration of said first phase polymeric component and said second phase polymeric component;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid multiple phase construction wherein said first phase polymeric component and said second phase polymeric component are disposed in interpenetrating blended relation wherein said first phase polymeric component and said second phase se polymeric are present at levels within said interpenetrating blend such that;

$$\frac{Va}{Vb}\ \frac{\mu b}{\mu a}$$

may not substantially equal 1 wherein,

Va is the volume percentage of said first phase polymeric component;

Vb is the volume percentage of said second phase polymeric component;

μa is the viscosity of said first phase polymeric component during the chaotically mixing step; and

μb is the viscosity of said second phase polymeric component during the chaotically mixing step.

Claim 163 (original). The method as recited in claim 162, wherein:

$$\frac{Va}{Vb}\ \frac{\mu b}{\mu a}$$

is greater than about 2.

claim 164 (original). The method as recited in claim 162, wherein;

$$\frac{Va}{Vb}\ \frac{\mu b}{\mu a}$$

is greater than about 5.

claim 165 (original). The method as recited in claim 162, wherein:

$$\frac{Va}{Vb}\ \frac{\mu b}{\mu a}$$

is in the range of about 10 to about 140.

claim 166 (original). The method as recited in claim 162, wherein said first phase polymeric component is low density polyethylene and said second phase polymeric component is polystyrene.

claim 167 (original). A method for the manufacture of a multiple phase composite construction having a major phase component and at least one minor phase component arranged in a desired predefined morphological structure comprising a plurality of substantially discrete platelets, the method comprising the steps of:

supplying said major phase component to a chaotic mixer in a substantially controlled manner;

supplying said at least one minor phase component to said chaotic mixer in a substantially controlled manner;

chaotically mixing said major phase component with said at least one minor phase component within said chaotic mixer such that said major phase component and said at least one minor phase component form an in-situ structured arrangement formed progressively according to a preestablished and controllable evolutionary process, wherein said structured arrangement comprises a plurality of substantially discrete platelets of said major phase component and said at least one minor phase component;

controlling the chaotically mixing step such that the chaotic mixing is terminated at a controlled stage following formation of said substantially discrete platelets;

discharging said in-situ structured arrangement from said chaotic mixer in the form of a structured extrudate; and

controllably forming said structured extrudate into a substantially solid structure having said predefined morphological structure.

claim 168 (original). The method as recited in claim 167, wherein said major phase component comprises a polymeric material.

claim 169 (original). The method as recited in claim 168, wherein said at least one minor phase component comprises a polymeric material.

claim 170 (original). The method as recited in claim 167, wherein said major phase component comprises a non-polymeric viscous material.

claim 171 (original). The method as recited in claim 167, wherein said at least one minor phase component comprises a non-polymeric viscous material.

claim 172 (original). The method as recited in claim 167, wherein the chaotic mixing step is carried out as substantially two dimensional chaotic mixing.

claim 173 (original). The method as recited in claim 167, wherein the chaotic mixing step is carried out as substantially three dimensional chaotic mixing.

claim 174 (original). The method as recited in claim 167, wherein the chaotically mixing step comprises a plurality of substantially discrete controllable mixing stages of differing functionality to produce predetermined staged morphology changes within the group consisting of said major phase component and said at least one minor phase component.

claim 175 (original). The method as recited in claim 174, wherein the controlling step includes selectively varying the shear rate in the chaotic mixer at different stages during the chaotically mixing step.

claim 176 (original). The method as recited in claim 174, wherein the controlling step includes utilizing a selective combination of two dimensional chaotic mixing and three dimensional chaotic mixing.

claim 177 (original). The method as recited in claim 174, wherein the controlling step includes reversing the direction of mixing during the chaotically mixing step whereby structural morphology development is at least partially reversed such that the size of the platelets within the in-situ structured arrangement is increased.

claim 178 (original). The method as recited in claim 174, wherein said supplying steps and said discharging steps are carried out in a substantially continuous manner.

claim 179 (original). The method as recited in claim 167, wherein said multiple phase composite construction includes two or more minor phase components.

claim 180 (original). The method as recited in claim 167, wherein said multiple phase composite construction includes three or more polymeric constituents.

claim 181 (original). The method as recited in claim 167, wherein at least one of the group consisting of said major phase component and said at least one minor phase component includes an additive to reduce interfacial tension.

claim 182 (original). The method as recited in claim 167, wherein said major phase component is electrically conductive and said at least one minor phase component is substantially electrically non-conductive.

claim 183 (original). The method as recited in claim 167, wherein said major phase component is substantially electrically non-conductive and said at least one minor phase component is electrically conductive.

claims 184-231 (cancelled)